

## Cargo tank linings - the issues

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The need for tank coatings to be flexible enough to handle the desired range of cargoes and for coated surfaces to be as smooth as possible are perennial concerns for those involved in tank linings. The chemical resistance performance of cargo tank coatings varies in proportion to the brittleness and surface roughness of the coating. Relatively brittle coatings can give rise to cracks in way of the many "welding hot spots" often found on modern, flexible product/chemical tankers. Such hot spots are areas of stress concentration and often occur as a result of attempts by the shipyards to save on steelweight and simplify the ship construction process. Yards exert considerable commercial pressure to enable the speed at which ships are built to be increased, and some of this pressure falls on class societies to be more tolerant in applying their own structural criteria.

In addition, coatings with rough surfaces tend to retain cargo and wash water remnants. This makes proper tank cleaning more complicated and, consequently, more time-consuming. For tankers engaged in trades with short ballast legs, the inability to clean the tanks properly may result in extra cost for for the shipowner, both for additional cleaning chemicals and due to loss of hire.

Another key issue is the changing nature of some important refined product cargoes, most notably gasoline, and the ability of established coating systems to provide the necessary degree of chemical resistance. In order to comply with the increasingly stringent clean air regulations, the specifications for gasoline are being changed. The original replacement for lead as an octane enhancer was methyl tertiary butyl ether (MTBE). Although MTBE also serves as an oxygenate, improving the clean-burning characteristics of the fuel, there are growing concerns in certain US states about the groundwater pollution threat of this chemical, should it leak. Increasingly, refiners are considering the addition of alcohols such as ethanol to gasoline as a substitute for MTBE.

These changing goalposts do not make it easy for suppliers of tank coating systems. The established cargo resistance lists, compiled to provide the owner with a simple, clear guide as to the the most appropriate cargo coating system, are no longer relevant due to the changing gasoline specifications.

For tanker owners the ideal tank coating system would be one comprising a single, thin layer of paint which could be applied without any pre-treatment. This coating could be cured within a quarter of an hour but would remain intact and maintenance-free for the service life of the ship, obviating the need for recoating.

Such tank coatings would be resistant to the hundreds of bulk liquids commonly carried by sea, including the full range of chemical, vegetable oil and petroleum product cargoes. Finally, the perfect coating would only cost almost as much as the cheap latex-based coatings sold in the supermarket and, in a really ideal world, could be simply applied through the nozzles of the tank cleaning machine.

Real life is different, however, and the changing nature of ship operations is placing additional pressures on the shipowner in respect of cargo coating systems. The drive to reduce operating expenses and boost margins has served to cut crew manning levels while the nationalities of the crew members themselves are changing.

Budget restraints are also leading to cutbacks in the number of technical department personnel, including ship superintendents. In such an environment, cargo tank coatings are considered to be less important than the high-tech equipment on the tanker's bridge and in the engine room.

Unfortunately, it is now the case with many tanker newbuildings that coatings do not always receive the attention they deserve during the application process. As a result, the first bills for coating repairs are often being presented not long after the ship's delivery. In my opinion this downward pressure on operating expenses, in tandem with inadequate attention during the application at the shipyard, is the most critical tank coating issue at the moment.